

63- HI mill
175647 245

19

REFERENCE _____
SITE NAME High-Mill Manu.
SITE ID ME000341714

JAN 1

A Hydrogeological Study of the Vicinity of
HiMill Manufacturing, Highland, Michigan

Water Quality Division
Groundwater Unit
Kathleen Sibo, Geologist
August 31, 1982

Table of Contents

<u>Section</u>	<u>Page No.</u>
Summary	1
Procedure	2
Geology and Ground Water Flow	3
Sampling Results	4
Conclusions	5
Personnel	5

List of Tables

<u>Table</u>	<u>Table No.</u>
Well and Water Elevations	1
Metals Content of Water Samples	2

List of Figures

<u>Figure</u>	<u>Figure No.</u>
Water Table	1
Chromium Concentration	2
Aluminum Concentration	3
Copper Concentration	4
Zinc Concentration	5

Appendix

Well Records

Summary

The HiMill Manufacturing Company, located on M-59 in Highland, Michigan, Oakland County, T3N R7E Section 23, makes fabricated tubing and fittings using copper or aluminum tubing (Legrand assessment July 29, 1980). The HiMill property borders on the Highland State Recreation Area. The HiMill lagoon is adjacent to a marsh connected to Waterbury Lake.

Wells were installed in the Highland Recreation Area outside the eastern and southern fence line of HiMill Manufacturing to determine if heavy metals were leaching from the HiMill lagoon into the adjacent marsh. Elevated levels of aluminum, copper, chromium and zinc were detected to the east and south-east of the lagoon. Somewhat less elevated levels of these metals were detected to the north-east of the lagoon, near the edge of the HiMill parking lot. Each of these wells was in or adjacent to the marsh and in the direction of groundwater flow from the HiMill property to the marsh.

Procedure

A preliminary site inspection was made on July 9, 1980 at the HiMill Manufacturing Company on M-59 in Highland, Michigan, which produces fabricated tubing and fittings (Legrand assessment, July 29, 1980). The inspection included some hand augering to determine the types of sediment on the site.

The wells were installed on May 18, 1981. The boreholes were hand-augered and the wells were installed to a maximum depth ranging from 3.84 to 6.9 feet. The wells were constructed of 1-1/4 inch I.D. schedule 80 PVC casing with 3 foot long size 7 slot PVC screens. The well annuli were packed to above the screen with #3 silica sand from the Gibraltar Corporation. Bentonite pellets or powdered bentonite was used to complete the filling to the ground surface (see appendix).

The wells were sampled on May 19, 1981, using a hand-operated diaphragm pump. The wells were pumped dry, rinsed with a small amount of Lansing city water and pumped dry again to help clear them. They were then allowed to re-fill before being sampled. Lansing city water was also pumped through the pump and hose to rinse them between the pumping of individual wells. Samples were taken for totals of chromium, copper, nickel, lead, zinc, and aluminum and were preserved and cooled according to MDNR Environmental Laboratory procedures. Water levels were measured by chalked tape on June 23, 1981 (see Table 1) and the site was mapped by the MDNR Engineering Division.

Geology and Ground Water Flow

The project site consists of relatively pure, dense clays and thin layers of sandy or gravelly clays. These generally are the result of water deposition and indicate a low permeability clay. This low permeability was observed during sampling by the slowness with which water entered the wells.

The top of the water table is at the ground surface in the vicinity of well HM3, approximately 35 feet east of the lagoon, at an elevation of 1006.0 feet. Ground water flow on the site is east, southeast, and south from the HiMill property into the adjacent marsh (see Table 1 and Figure 1).

Sampling Results

The location of well HM6 southwest of the lagoon was chosen for use as a background well since according to water table measurements it appeared to be out of the influence of drainage from the lagoon. Sampling results confirmed this since the metals concentrations of the water in HM6 were substantially lower than the highest metals concentrations and less than or equal to the lowest metals concentrations of water in the other wells (see Table 2).

The total chromium concentrations of the water in the wells varied from less than 50 ug/l to 160 ug/l (see Table 2 and Figure 2). The two wells with the highest chromium concentrations, HM3 with 160 ug/l and HM4 with 130 ug/l, lie to the east of the HiMill lagoon. The third highest, well HM1 east of the edge of the parking lot, had a chromium concentration of 110 ug/l.

The aluminum concentrations of the well water samples ranged from 1800 ug/l to 7900 ug/l (see Table 2 and Figure 3). Well HM5 southeast of the lagoon had the highest aluminum concentration; 7900 ug/l. The two wells with the next highest aluminum concentrations were HM1, east of the edge of the parking lot, with a concentration of 4600 ug/l, and HM3, east of the lagoon, with a concentration of 4000 ug/l.

The copper concentrations of the water in the wells varied from 30 ug/l to 840 ug/l (see Table 2 and Figure 4). The well with the highest copper concentration, 840 ug/l, was HM4 southeast of the lagoon. The two next highest copper concentrations were 480 ug/l in HM3 east of the lagoon, and 230 ug/l in HM1 east of the edge of the parking lot.

The zinc concentration of the well water samples ranged from less than 50 ug/l to 240 ug/l (see Table 2 and Figure 5). Well HM3 east of the lagoon with 240 ug/l was the well with the highest zinc concentration. The next highest zinc concentration was 110 ug/l in HM1 east of the edge of the parking lot.

Conclusions

The aluminum concentration was approximately 4.4 times higher in well HM5 and approximately 2.6 times higher in well HM1 than in background well HM6. The zinc concentration was approximately 4.8 times higher in well HM3 and at least 2.2 times higher in well HM1 than in background well HM6. The total chrome concentration was 3.2 times higher in well HM3, less than 2.6 times higher in HM4, and more than 2.2 times higher in HM1 than in well HM6. The copper concentration was 28 times higher in HM4, 16 times higher in HM3, and approximately 7.7 times higher in HM1 than in the background well HM6.

This information combined with measurements of the top of the water table (see Figure 1) indicate that copper, aluminum, chromium, and zinc are leaving the HiMill plant site in the ground water and are flowing into the adjacent Highland Recreation area. Most of the metals are migrating east and east-southeast from the lagoon area and were detected by wells HM3 and HM4. Some of the metals are migrating from the northeast end of the plant site and were detected by well HM1 near the edge of the parking lot. Aluminum and small amounts of chromium, copper, and zinc are migrating southeast from the lagoon area and were detected by well HM5.

Project Personnel

Geologist:	Kathleen Sibo
Driller:	Charles Ingalls
Driller's Assistant:	Jerry Parish
Supervisor:	Elmore Eltzroth
Surveyor:	Gary Bilow, MDNR Engineering Division
Analysis:	MDNR Environmental Laboratory
Drafting:	Gary Taylor, MDNR Engineering Division

Table 1 Well Elevations and Water Elevations in Feet; HiMill Inc. Vicinity
June 23, 1981

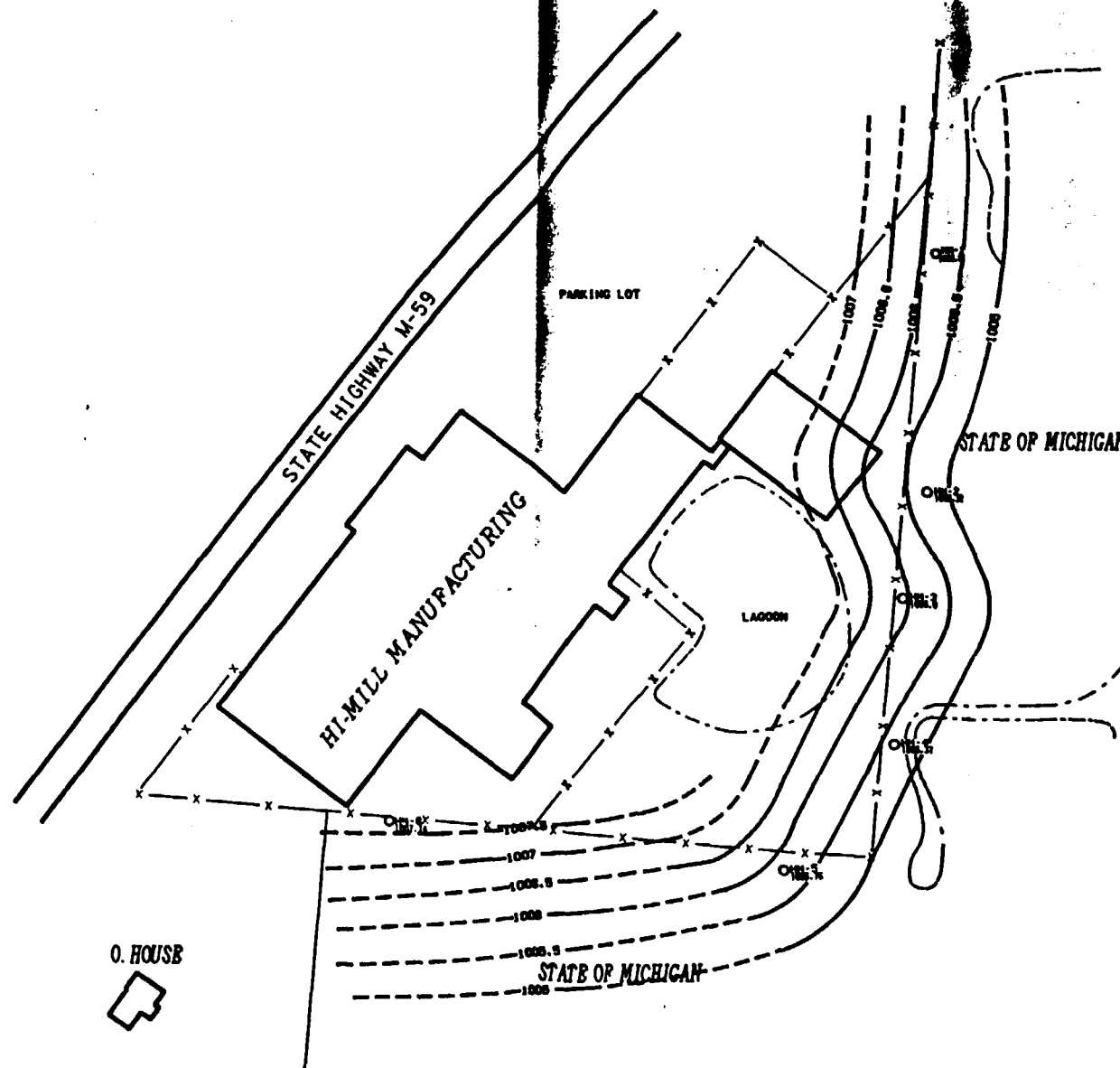
Well	Elevation Top of Casing	Elevation Ground	Height of Casing	Depth to Water	Elevation Water
HM1	1007.53	1006.5	1.03	1.62	1005.91
HM2	1007.07	1006.0	1.07	1.75	1005.32
HM3	1010.16	1006.0	4.16	4.7	1006.0
HM4	1009.58	1006.2	3.38	4.21	1005.37
HM5	1010.40	1006.4	4.0	4.64	1005.76
HM6	1011.09	1009.9	1.19	3.35	1007.74

Elevations are based on MDOT Bench Mark 156A.

Table 2 Metals Content of Water Samples, HiMill Vicinity - May 19, 1981

Well	Depth (feet)	Total Cadmium (ug/l)	Total Chromium (ug/l)	Total Copper (ug/l)	Total Nickel (ug/l)	Total Lead (ug/l)	Total Zinc (ug/l)	Total Aluminum (ug/l)
HM1	6.9	K 20	110	230	K 50	K 50	110	4600
HM2	6.9	K 20	80	30	K 50	K 50	60	2500
HM3	3.84	K 20	160	480	K 50	K 50	240	4000
HM4	4.62	K 20	130	840	K 50	K 50	K 50	3000
HM5	4	K 20	K 50	90	K 50	K 50	70	7900
HM6	6.81	K 20	K 50	30	K 50	K 50	K 50	1800

Note: Depth is measured from ground level to the bottom of a three foot screen.
K = Actual value is less than value given.



SURVEY NOTES:

- PLANIMETRY IS TRACED FROM MICHIGAN DEPARTMENT OF TRANSPORTATION PLANS FOR M-59 CONSTRUCTION AND PLOTTED FROM FIELD MEASUREMENTS.
- PROPERTY LINES ARE APPROXIMATE.
- OWNERSHIP TAKEN FROM OAKLAND COUNTY TAX RECORDS.

FIGURE 1

HI-MILL MANUFACTURING
SHALLOW WATER TABLE
JUNE 23, 1981
CONTOUR INTERVAL .5 FEET

E.N.S. 1982

LEGEND

OW-1 GROUNDWATER TEST WELL

X FENCE

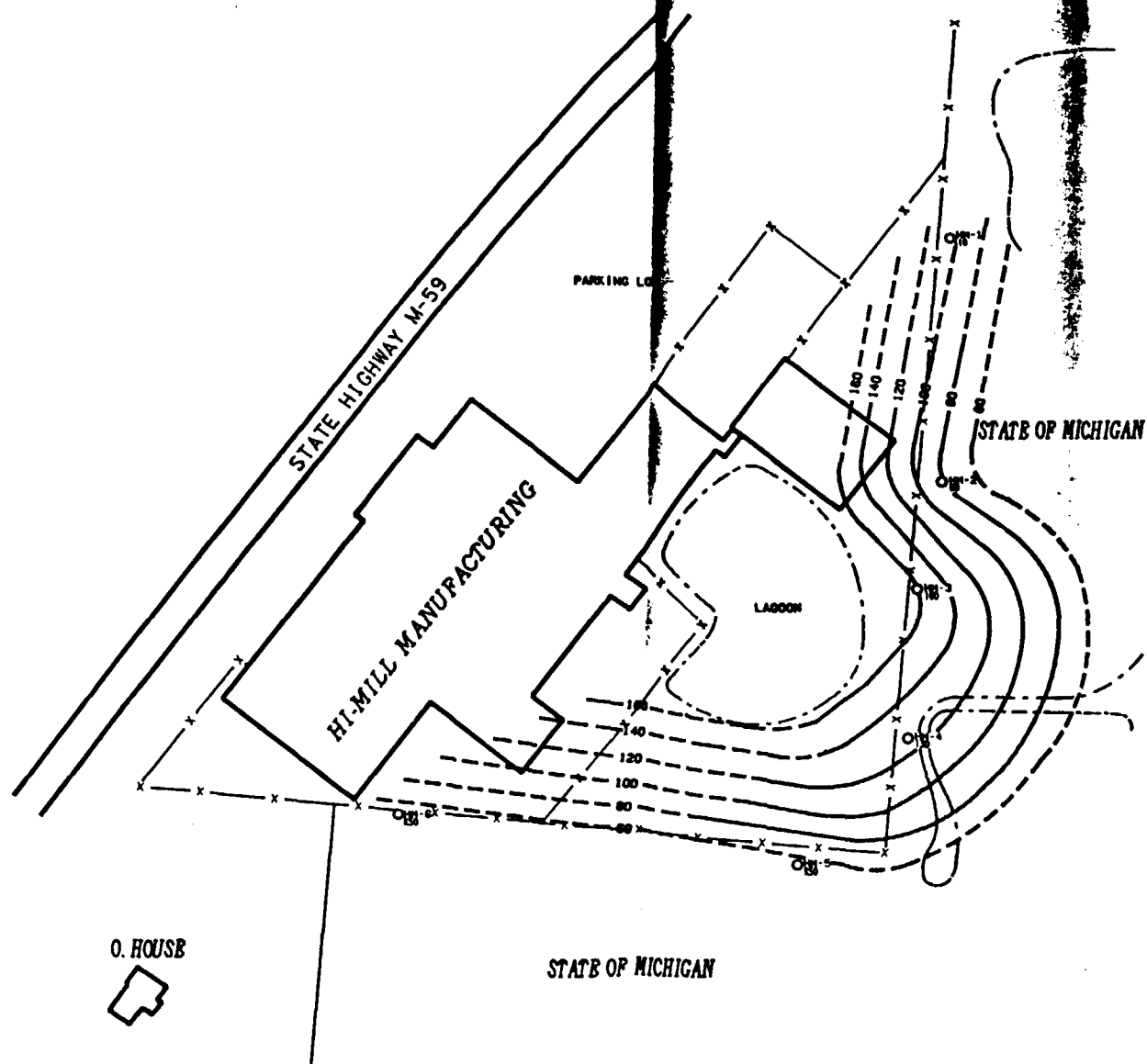
— WATER LINE

O. HOUSE



1" = 100'

DESIGNED BY: RUPP C. GILBY	DRAWN BY: RUPP V. TAYLOR	NO. DATE BY	REVISION	NO. DATE BY	REVISION	BY: RUPP C. GILBY	TEST WELL LOCATIONS	OAKLAND COUNTY JUNE 23, 1981 REVISION: 1 PROJECT NO: 87-00213	NO. DATE BY	REVISION
		1		1						



SURVEY NOTES:

- PLANIMETRY IS TRACED FROM MICHIGAN DEPARTMENT OF TRANSPORTATION PLANS FOR M-59 CONSTRUCTION AND PLOTTED FROM FIELD MEASUREMENTS.
- PROPERTY LINES ARE APPROXIMATE.
- OWNERSHIP TAKEN FROM OAKLAND COUNTY TAX RECORDS.

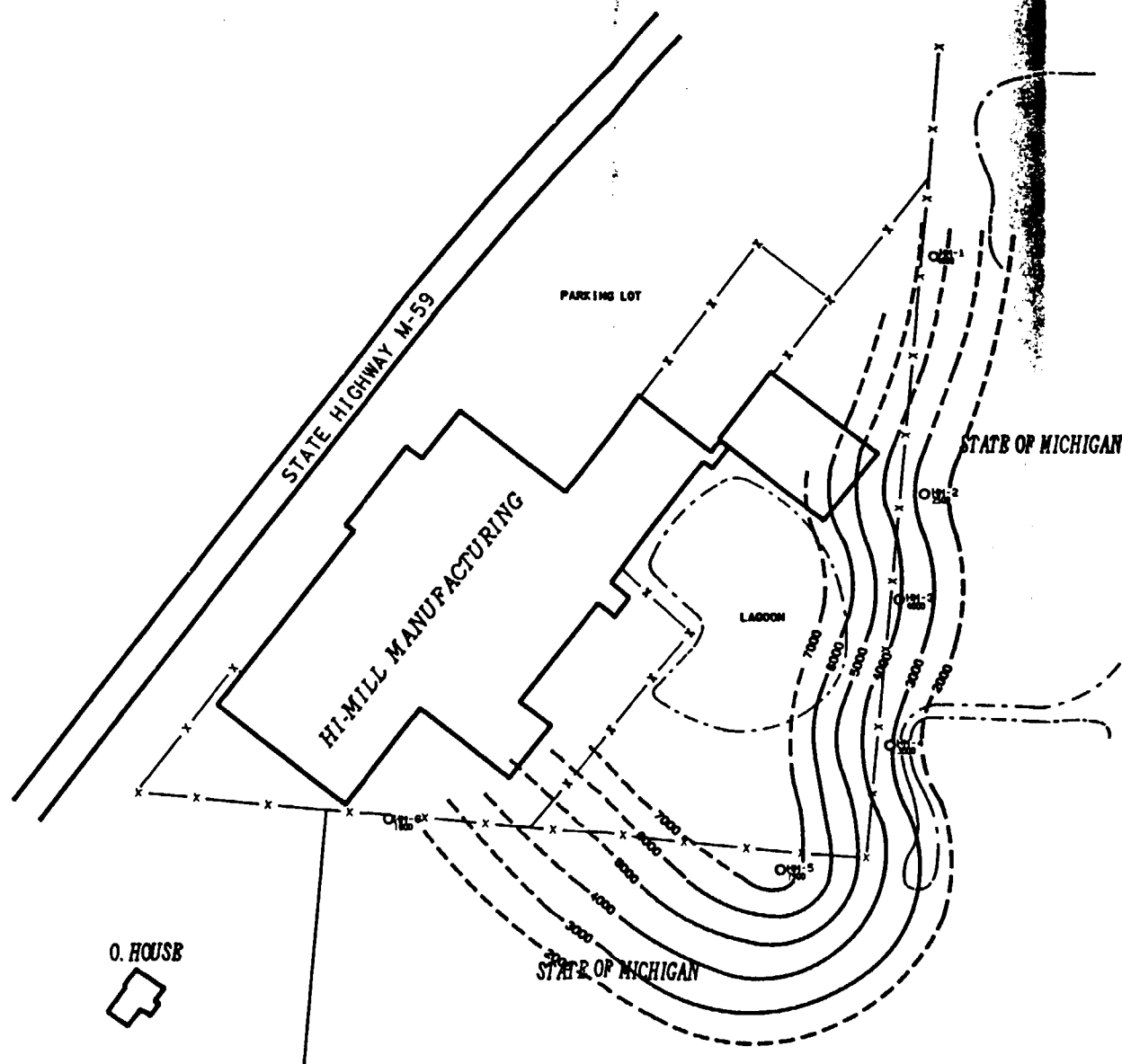
FIGURE 2
HI-MILL MANUFACTURING
CHROMIUM CONCENTRATION
MAY 19, 1981
CONTOUR INTERVAL 20 MG/L

K.H.S. 1982

LEGEND

- O-1 GROUNDWATER TEST WELL
- X FENCE
- WATER LINE

DESIGNED BY: SHIP C. G. L. W.	DRAWN BY: SHIP C. G. L. W.	NO. DATE BY	REVISION	NO. DATE BY	REVISION	BY: SHIP C. G. L. W.	TEST WELL LOCATIONS	DATE: 11/14	PROJECT: 37-00213
CHECKED BY:	CHECKED BY:	1		2		RE: LOCATION OF CHROMIUM CONCENTRATION			DATE: 1/1/82
		2		3					DATE: 1/1/82



SURVEY NOTES.

- PLANIMETRY IS TRACED FROM MICHIGAN DEPARTMENT OF TRANSPORTATION PLANS FOR M-59 CONSTRUCTION AND PLOTTED FROM FIELD MEASUREMENTS.
- PROPERTY LINES ARE APPROXIMATE.
- OWNERSHIP TAKEN FROM OAKLAND COUNTY TAX RECORDS.

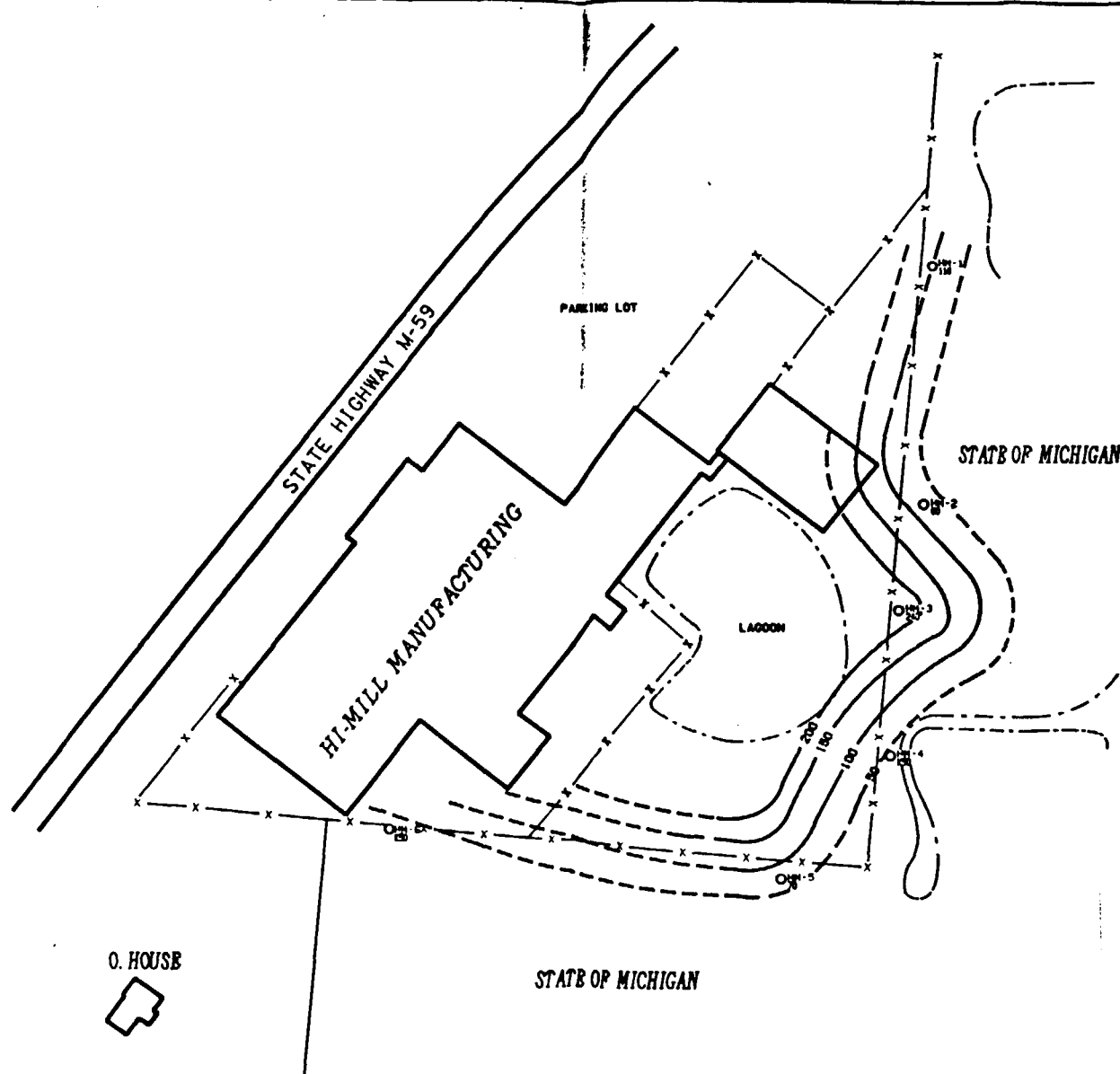
FIGURE 3
HI-MILL MANUFACTURING
ALUMINUM CONCENTRATION
MAY 19, 1981
CONTOUR INTERVAL 1000 MG/L

E.N.S. 1982

LEGEND

- OHL- GROUNDWATER TEST WELL
- X — FENCE
- WATER LINE

DESIGNED BY: SHIP C. ELLIS	DRAWN BY: SHIP V. TAYLOR	NO. DATE BY	REVISION	NO. DATE BY	REVISION	SCALE	TEST WELL LOCATIONS	OAKLAND COUNTY	PROJECT NO. 37-00213
DATE: 5-11-82	DATE: 5-11-82	1		1		1" = 100'		5-11-82	5-11-82



SURVEY NOTES.

- PLANIMETRY IS TRACED FROM MICHIGAN DEPARTMENT OF TRANSPORTATION PLANS FOR M-59 CONSTRUCTION AND PLOTTED FROM FIELD MEASUREMENTS.
- PROPERTY LINES ARE APPROXIMATE.
- OWNERSHIP TAKEN FROM OAKLAND COUNTY TAX RECORDS.

FIGURE 5

HI-MILL MANUFACTURING
ZINC CONCENTRATION
MAY 19, 1981
CONTOUR INTERVAL 50 MG/L

R.N.S. 1982

LEGEND

- OWM-1 GROUNDWATER TEST WELL
- X — FENCE
- - - WATER LINE



SCALE
0 50 100 FEET

DESIGNED BY: RAY L. ELLIS	DRAWN BY: GARY E. TAYLOR	NO. 1 DATE: 07	REVISION:	NO. 2 DATE: 07	REVISION:	MICHIGAN DEPARTMENT OF NATURAL RESOURCES	TEST WELL LOCATIONS	OAKLAND COUNTY AREA OF MAP: Section 29, T2N-R7E HI-MILL MANUFACTURING PROPERTY: OAKLAND COUNTY	PROJECT NO. 37-00013	SHEET 1 OF 1	DATE: 1982
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Appendix

MICHIGAN DEPARTMENT OF NATURAL RESOURCES
 DIVISION OF WATER RESOURCES
 SECTION OF WELL REGISTRATION UNIT
 TEST WELL RECORD

WELL NO.
 HM 2

PROJECT: Hi-Mill Vicinity

PERM NO.
 791-812-463

LOCATION
 COUNTY

Oakland

TOWNSHIP AND RANGE

Highland

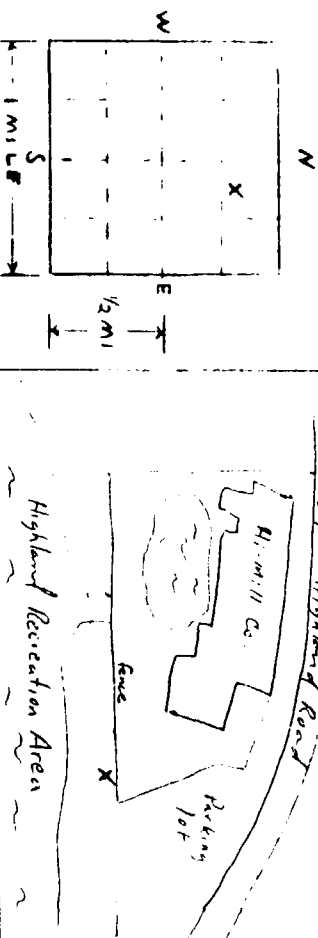
FRACTION 1 SE 1/4 NW 1/4 NE 1/4

STREET ADDRESS AND CITY OF WELL - LOCATION

Highland Road (M59), Highland, MI.

LOCATION IN SECTION
 (MARK WITH 'X')

SKETCH MAP OF LOCATION (NO SCALE)



SECTION NO.

23

TOWN

MS

RANGE

E/W

PROPERTY OWNER State of Michigan
 ADDRESS Highland State Recreation Area
 Highland Road
 Highland MI. 48031

WELL DEPTH (COMPLETED) DATE OF COMPLETION
 6.9 ft. 5/18/81

DRIILLING METHOD(S) DEPTH(S)

3" hand auger 7 feet

CASING: DIAMETER 1 1/4" IN TO 3.9 FT. DEPTH WEIGHT ABOVE SURFACE 10.3 FT

IN. TO FT. DEPTH TYPE PVC WEIGHTS 30

SCREEN: PVC DIAM. 1 1/4"

SLOT/SAUZE 7 slot LENGTH 3 ft.

SET BETWEEN 3.9 FT. AND 6.7 FT.

WATER LEVELS 3-4 FT BELOW SURFACE
 FIRST NOTED AT 3-4 FT BELOW SURFACE
 AFTER COMPLETION 1.62 FT BELOW
 SURFACE OR CASING TOP

SURFACE ELEVATION 1006.5 ft.

SEALING METHODOD Sand packed to 25' in
 surface, filled to surface with powdered
 bentonite.

CREW Driller Charles Ingalls
 Driller's Assistant Jerry Parrish

Geologyist Kathleen S. by
 RECORD BY Kathleen S. by

DATE 6/26/81

REMARKS

Clay, dense + plastic, blue-grey
 w/ limonite staining.

PLUGGING AND ABANDONMENT METHOD

DATE
 CREW
 RECORD BY

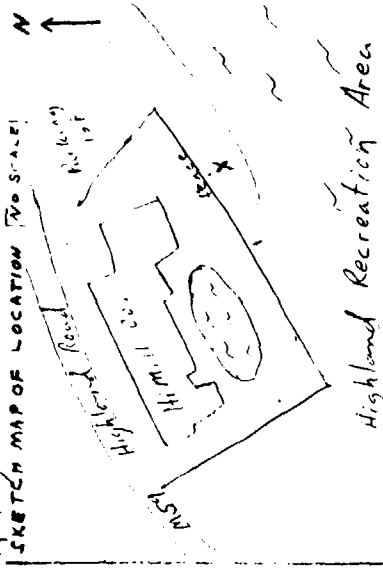
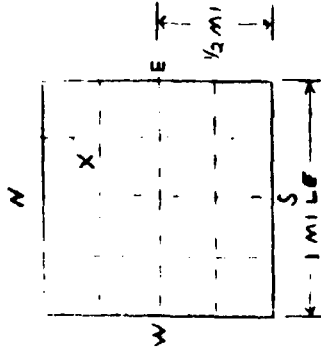
WELL NO.
HM 2

PLAT NO.
791-812-463

TEST WELL RECORD

PROJECT: Hi-Mill, vicinity

LOCATION
COUNTY
Oakland
TOWNSHIP NAME
Highland
FRACTION
SE 1/4 NW 1/4 NE 1/4
STREET ADDRESS AND CITY OF WELL LOCATION
Highland Road (M59), Highland
LOCATION IN SECTION
(MARK WITH "X")



DEPTH FROM TO
0' 7' 7' Clay - grey

DESCRIPTION

SAMPLE IDENTIFICATION NO. TYPE

SECTION NO.
23

TOWN
T3 N

RANGE
R7 E

E/W

PROPERTY OWNER State of Michigan
ADDRESS Highland State Recreation Area
Highland Road
Highland, MI 48031

WELL DEPTH (COMPLETED) DATE OF COMPLETION
6.9 ft 5/18/81

DRILLING METHOD(S) DEPTH(S)

3" hanger 7 feet

CASING: DIAMETER HEIGHT ABOVE SURFACE

1 1/4 IN. TO 3.9 FT. DEPTH 1.92 FT

IN. TO FT. DEPTH TYPE PVC WEIGHT 30 30

SCREEN: PUC DIAM. 1 1/4

SLOT/GAUZE 7 slot LENGTH 3 ft.

SET BETWEEN 3.9 FT. AND 6.9 FT.

WATER LEVELS FIRST NOTED AT FT. BELOW SURFACE

AFTER COMPLETION 1.25 FT BELOW SURFACE OR CASING TOP

SURFACE ELEVATION 1006 ft.

SEALING METHOD Sand packed to with.

2 1/3" of top, powdered bentonite to the surface

CREW Driller Charles Ingalls

Driller's Assistant Jerry Pernish

Geology st Kathleen Sibb

RECORDED BY Kathleen Sibb

DATE 6/26/81

REMARKS

PLUGGING AND ABANDONMENT METHOD

DATE
CREW
RECORD BY

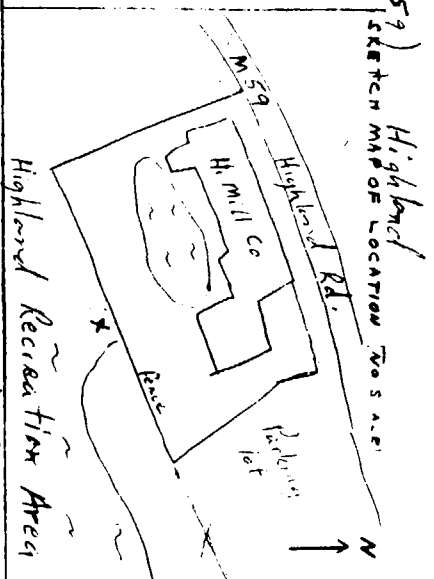
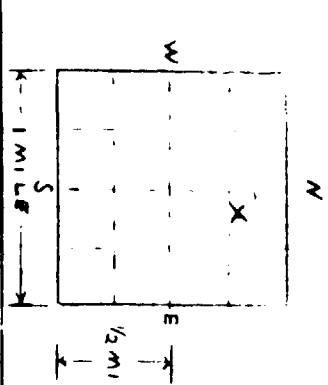
WELL NO. HM3

PROJECT: Hi-Mill Vicinity

PART NO. 791-812-463

LOCATION
 COUNTY Oakland
 STREET ADDRESS AND CITY OF WELL - LOCATION
Highland Road, Highland
 LOCATION IN SECTION
 [MARK WITH "X"]

TOWNSHIP AND RANGE
 T3N R7E
 SECTION NO. 23



DEPTH	THICKNESS OF STRATUM	DESCRIPTION	SAMPLE IDENTIFICATION NO.	SAMPLE TYPE
-------	----------------------	-------------	---------------------------	-------------

0' 3'	3'	Clay		
3' 3 1/2"	6"	Clay, gravelly, sandy		
3' 6" 4'	6"	Clay		

PROPERTY OWNER STATE OF MICHIGAN
 ADDRESS Highland State Recreation Area
 Highland Road
 Highland MI. 48031

WELL DEPTH (COMPLETED) DATE OF COMPLETION
 3.84 ft. 5/18/81
 DRILLING METHOD(S) DEPTH(S)

3" hand auger 4 feet
 CASING: 1 1/4" DIAMETER
 1 1/4" IN. TO 3.84' FT. DEPTH
 1 1/4" IN. TO 4.7' FT. DEPTH
 IN. TO FT. DEPTH TYPE WEIGHT

SCREEN: PVC DIAM. 1 1/4"
 TYPE
 SLOTS/GAUZE 7 slot LENGTH 3 ft.
 SET BETWEEN .84 FT. AND 3.84 FT.
 WATER LEVELS 21 FT BELOW SURFACE
 FIRST NOTED AT 4.7 FT BELOW
 AFTER COMPLETION 4.7 FT BELOW
 SURFACE OR CASING TOP

SURFACE ELEVATION 1006 ft.

SEALING METHOD Sand packed to with
 2 in. of surface, then filled to surface
 with powdered bentonite, bentonite pellet.

CREW Driller Charles Ingalls
 Drillers Assistant Jerry Parrish
 Geologist Kathleen Sibo
 RECORD BY Kathleen Sibo
 DATE 6/30/81
 REMARKS

PLUGGING AND ABANDONMENT METHOD

DATE
 CREW
 RECORDED BY

WELL NO. HM4

PROJECT: Hi Mill Vicinity

PAGE NO. 791-812-463

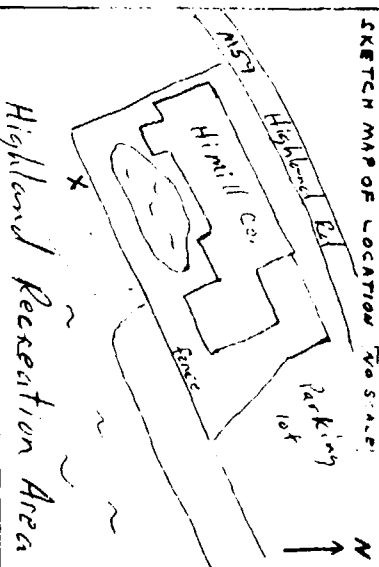
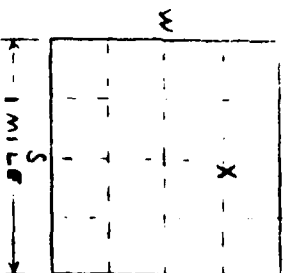
LOCATION
 COUNTY Oakland

TOWNSHIP NAME
Highland

RANGE
SW 1/4 NW 1/4 NE 1/4

STREET ADDRESS AND CITY OR WELL - LOCATION

Highland Road (MS9) Highland
 LOCATION IN SECTION
 (MARK WITH "X")



DEPTH FROM TO	THICKNESS OF STRIUM	DESCRIPTION	SAMPLE LOCATION	TYPE
0' 2'	2'	clay		
2' 4'	2'	Muck, dark, with sand and some clay and gravel.		
4' 5'	1'	clay		

SECTION NO. 23 TOWN T3N RANGE N5 E1W

PROPERTY OWNER STATE OF Michigan

ADDRESS Highland State Recreation Area
Highland Road, Highland, MI.

WELL DEPTH (COMPLETELY DATE OF COMPLETION)
4.62 ft. 5/18/81

DRILLING METHOD(S) DEPTH(S)

3" hand auger 5 feet

CASING: DIAMETER 1 1/4" IN. TO 1.62 FT. DEPTH 3.38 FT

IN. TO FT. DEPTH TYPE PVC WEIGHT 30 LB

SCREEN: PVC DIAM. 1 1/4"

SLOT/SAZE 7/32" LENGTH 3 ft.

SET BETWEEN 1.62 FT. AND 4.62 FT.

WATER LEVELS 1 FT BELOW SURFACE

AFTER COMPLETION 4.21 FT BELOW SURFACE OR CASING TOP

SURFACE ELEVATION 1006.2

SEALING METHOD Sand packed to within 2-3 in. of surface, then bentonite pellets to surface.

CREW Driller Charles Ingalls

Drillers ASSISTANT Jerry Purvish

Geologist Kathleen Sibley

RECORD BY Kathleen Sibley

DATE 6/26/81

REMARKS

PLUGGING AND ABANDONMENT METHOD

DATE
 CREW
 RECORD BY

MICHIGAN DEPARTMENT OF ENVIRONMENTAL SCIENCE
GROUNDWATER INVESTIGATION
TEST WELL RECORD

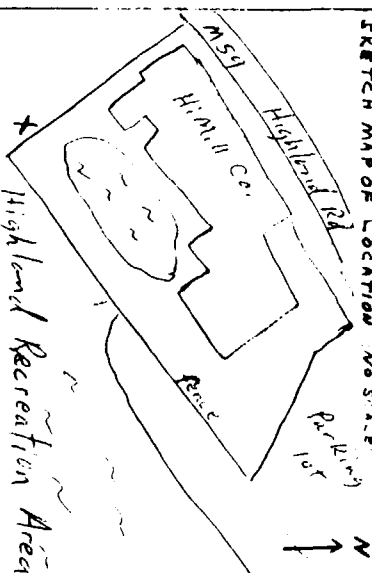
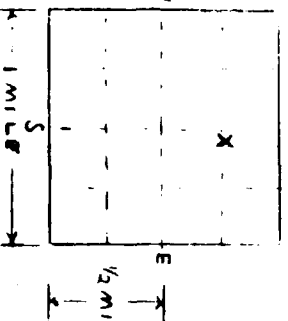
WELL NO. HMS

PROJECT: Hi Mill Vicinity

PERMIT NO. 791-812-463

LOCATION
COUNTY Oakland
TOWNSHIP NAME Highland
STREET ADDRESS AND CITY OF WELL LOCATION
Highland Road (MS9) Highland
LOCATION IN SECTION
(MARK WITH 'X')

FRACTION 1 SW 1/4 NW 1/4 NE 1/4



SKETCH MAP OF LOCATION (NO SCALE)

DEPTH TO STRATUM	THICKNESS OF STRATUM	DESCRIPTION	SAMPLE IDENTIFICATION NO.	SAMPLE TYPE
------------------------	----------------------------	-------------	---------------------------------	----------------

0' 2"	2"	Top soil		
2' 4'	3 1/4'	Clay, dense grey-brown		

SECTION NO. 23 TOWN 3N RANGE 7E E/W

PROPERTY OWNER State of Michigan
ADDRESS Highland State Recreation Area
Highland Road
Highland MI, 48031

WELL DEPTH (COMPLETED) DATE OF COMPLETION
4 ft. 5/18/81

DRILLING METHOD(S) DEPTH(S)

3" hand auger 4 ft.

CASING: DIAMETER WEIGHT ABOVE SPACE

1 1/4 IN. TO 1 FT. DEPTH 4 FT

IN. TO FT. DEPTH TYPE PVC WEIGHT SEC. 30

SCREEN: PVC DIAM. 1 1/4"

TYPE SLOT/GAUZE 7 slot LENGTH 3 ft.

SET BETWEEN 1 FT. AND 4 FT.

WATER LEVELS FIRST NOTED AT 4.64 FT BELOW SURFACE

AFTER COMPLETION 4.64 FT BELOW SURFACE OR CASING TOP

SURFACE ELEVATION 1006.4

SEALING METHOD Sand pack to within a few inches of surface, bentonite pellets and powdered bentonite to surface.

CREW Driller Charles Ingalls
Driller's Assistant Jerry Morris
Geologist Kathleen S. G. 5160
RECORDED BY Kathleen S. G. 5160
DATE 6/26/81
REMARKS

PLUGGING AND ABANDONMENT METHOD

DATE
CREW
RECORDED BY

MINIST. DEPARTMENT OF
ENVIRONMENTAL SCIENCE
GROUNDWATER INVESTIGATION
TEST WELL RECORD

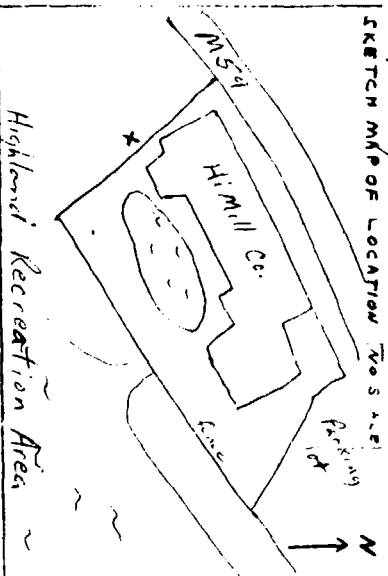
PROJECT: Hi Mill Vicinity

PLOT - NO.
791-812-463

OWN 4M6
Kland
ADDRESS AND CITY OF WELL - LOCATION
Highland
FRACTION SW 1/4 NW 1/4 NE 1/4

SECTION NO. 23 TOWN TSU N.S. 7E E/W

land Road (M 59) Highland
IN SECTION
WITH "X"



1 MI. L² 5
DESCRIPTION

3" 1'3" Clay, sandy & gravelly. May include some fill dirt.
7' 5'9" Clay, yellow w/ some sand and gravel.

PROPERTY OWNER State of Michigan
ADDRESS Highland State Recreation Area
Highland Road 48031
Highland MI.
WELL DEPTH (COMPLETION) DATE OF COMPLETION
6.81 ft. 5/19/81
DRILLING METHOD(S) DEPTH(S)
3" hand auger 7 ft.
CASING: DIAMETER WEIGHT ABOVE SURFACE
1 1/4" IN. TO 3.81 FT. DEPTH 1.19 FT.
IN. TO FT. DEPTH TYPE PNC WEIGHT SURFACE

SCREEN: PVC DIAM. 1 1/4"
TYPE
SLOT/AUGER 7 5/16" LENGTH 3 ft.
SET BETWEEN 3.81 FT. AND 6.81 FT.
WATER LEVELS AT BELOW SURFACE
FIRST NOTED AT FT. BELOW SURFACE
AFTER COMPLETION 3.35 FT. BELOW
SURFACE OR CASING TOP OF

SURFACE ELEVATION 1009.9
SEALING METHOD Sand packed to within
few inches of top, filled to surface with
bentonite pellets.

CREW Driller Charles Ingalls
Driller's Assistant Jerry Parrish
Geologist Kathleen Sibe
RECORDED BY Kathleen Sibe
DATE 6/24/81
REMARKS

PLUGGING AND ABANDONMENT METHOD

DATE
CREW
RECORDED BY